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EXHIBIT B

MEMS-based PC pointing device (for the disabled)

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The present invention describes the reduction to practice of a mouse-like pointer particularly adapted for disabled persons who have limited residual mobility (in particular those persons who are only able to move their heads).

The pointer uses a two-axis MEMS accelerometer operating as an inclinometer. This accelerometer (positioned in a convenient container, preferably plastic) is attached to a mobile limb of the patient.

For example, it is possible to place the hardware that composes the pointer in a container similar to that used for a hearing aid, attached to an arm of the disabled person's eyeglasses, or in a small case attached to the brim of a hat.

The signal from the accelerometer is acquired and digitized by a micro-controller that provides the information to the PC for cursor movement and click.

The displacement of the accelerometer (which senses the acceleration of gravity, i.e., head movement, changes of acceleration measured by the sensor) is employed to implement the functions of movement of the pointer on the screen and of the click.

In practice, when the X displacement (and Y, respectively) of the accelerometer in the module is greater than a selected threshold* (programmed by the user during the setup phase of the pointing device), the cursor moves in the direction X (or Y, respectively) (the polarity of the signal defines the directions left/right, front/back) with a velocity that depends on the amplitude of the acquired signal.

To click: the variation of the X signal (or Y, respectively) is measured with respect to the value of the previous sample.

In practice, calculating the value of the current sample minus the value of the previous sample determines the derivative of the signal in the X direction (or Y, respectively), and if this is greater than a given threshold, it is interpreted as pressure on a mouse key. Also in this case the minimum derivative/speed of movement of the head that releases the click is definable by the user.

From the point of view of the user, slow front/back and right/left movements of the head move the cursor on the screen of the computer (any head tremors are filtered by the selected threshold*), while fast movements of the head generate click actions.

The pointing system connects the tracking (sensor + micro-controller) to the PC through a thin cable (serial/USB) or via a radio frequency link (wave-radio). In the latter case it is powered by a small battery.

the ability to "quickly" move the head in four different directions allows the user to indicate four different types of clicks.

These can be defined, for example, in the following way:

- head movement to the right: right click
- head movement to the left: left click
- head movement forward: left click and hold (for internet navigation, scrolling pages...)
- head movement backward: release of left click

the cited functions/associations listed above are only representative, and can be reprogrammed via software by the user of the system).